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Flow-Through Share Financing

BASIL A. KALYMON

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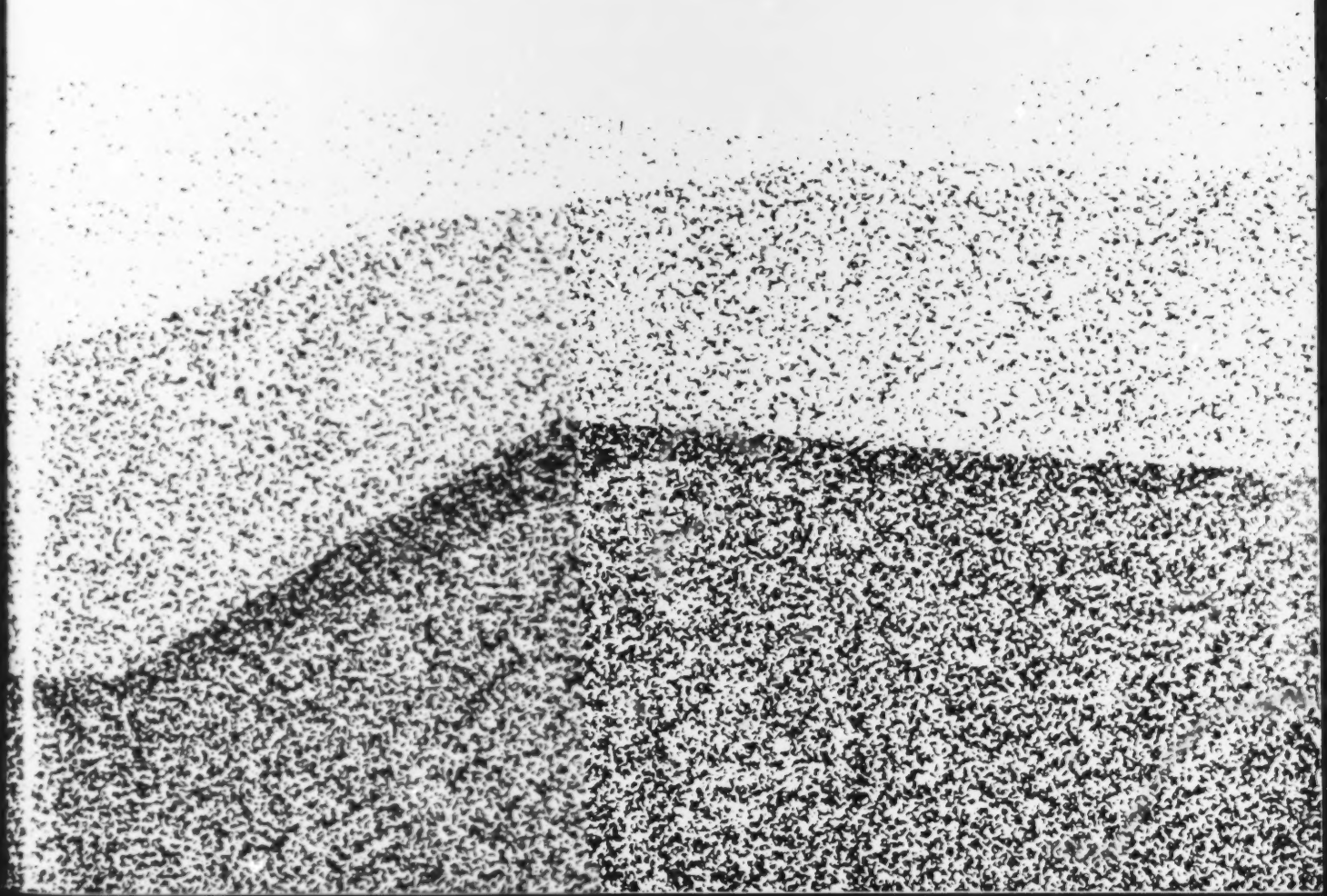

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FLOW-THROUGH SHARE FINANCING

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FOREWORD

This paper represents research supported by the Centre for Resource Studies aimed at improving the understanding of the conditions and issues facing the Canadian mineral industry, in order to assist in formulating policy decisions in industry and government. The Centre's working papers are offered for information and discussion, in an attempt to encourage feedback to the authors and additional research in mineral policy. Opinions presented are those of the author, and do not necessarily represent the views of the Centre or its sponsors.

Margot J. Wojciechowski
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1. INTRODUCTION

Flow-through shares were made possible through changes in tax legislation which originally were introduced in 1972. However, only after changes in the depletion allowance regulations making depletion allowances deductible against any source of income, and with the repeal of a rule which deemed flow-through shares to be inventory, have flow-through shares evolved as an important source of equity financing for the Canadian mining industry. While precedents of flow-through shares existed in the form of syndicates, major volumes of such share issues to the public appeared only after 1983. This study analyzes the impact and rationale for this form of financing. It also includes a comparison of the tax environment and financing vehicles currently existing in the mining sector of Australia.

Flow-through shares may be defined as an interest acquired in a mining venture in which the tax deductions resulting from the expenditures of the invested funds are attributed (or "flow through") to the original investor on whose behalf the activity is undertaken. More specifically under current Canadian tax laws, the tax deductions resulting from exploration activities can be attributed to the investor of equity funds in mining.[1] Principally, these deductions include the immediate 100 percent deduction, against income from any source, of monies spent on exploration, as well as the provision of an additional 33 1/3 percent of exploration expenditures as an "earned depletion" allowance for purpose of federal income taxes. The Province of Quebec has permitted the deduction of an additional 33 1/3 percent as a depletion allowance for certain exploration expenditures in Quebec. These deductions, being allocated to the original investor, are then foregone by the company actually undertaking the exploration activities. Discussion of flow-through share financing has, to date, been limited to the business and industry press (see Bibliography) together with some survey reports prepared by the Department of Energy Mines and Resources,[2] industry surveys,[3] and a

1. Prior to tax changes in the 1986 budget, the taxpayer earned the deduction by being the one incurring the expenditures in return for shares.
2. Lorraine Gailey, "Flow-through Share Financings in the Metals and Minerals Sector January 1, 1983 to March 31, 1985", Energy Mines and Resources, Mineral Policy Sector, (Draft); and "Tabulated results for VSE,TSE and ME with regard to flow-through share financing", Communication, July, 1986.
3. PDA Digest, "PDA conducts flow-through share survey", Summer 1985, p. 6; and "Results of latest PDA flow-through share survey", Winter 1985-86, p. 4.

student paper prepared at the Faculty of Management Studies of the University of Toronto.[4] As a financing vehicle with only recent widespread usage, mining flow-through shares have not yet received attention in academic publications.

Public debate on flow-through shares has centred around the question of their implications for stimulation of exploration and mining activity in general as well as their utility as tax shelter vehicles for the investor. Industry comment has been highly supportive of flow-through shares as an important stimulus for a depressed mining sector. Numerous modifications and extensions have been proposed to enhance the effectiveness and efficiency with which the funds are applied. These include the extension of the cut-off date at which expenditures on grass-roots exploration qualify as tax deductions in the previous tax year (to recognize the concentration of exploration activities in the winter months), and the removal of liability from the original investor by provision for the attribution of tax deductions without the legal requirement of potential liability for damages.

While both the above modifications were introduced by federal legislation, the government has, to date, resisted industry petitions for the extension of flow-through provisions to the depletion allowances related to development expenditures,[5] which would broaden the application of such financings. In addition, there is evident concern by taxing authorities over the direct tax revenue loss engendered by the use of flow-through shares as tax shelter vehicles by investors in high tax brackets.[6]

Some industry observers have expressed concern over the potential abuses which can occur.[7] Specifically, the cost of exploration activity is effectively reduced to 30 percent (or less) of direct expenditures through the offsets provided by the income tax system. Consequently, the incentive exists to manipulate the recorded costs of exploration to maximize the tax contribution while minimizing the sponsor or investor cost. In the extreme, totally fraudulent schemes of cost attribution could create conditions where no private funds are at risk and government tax credits fully fund exploration activity, or even where no actual exploration activity is undertaken for the tax credits claimed. These potential problems, from the perspective of this study, will be viewed as problems of auditing or enforcement and will not be explicitly explored.

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4. Bruce Hoeschen, "Flow-through Share Financing in Canada: Issues and Implications", Faculty of Management Studies, University of Toronto, December 16, 1985.
5. While the development expenditures themselves may flow through to investors at the normally permitted rates, the depletion allowance related to these expenditures cannot.
6. An indication of such concern is the exclusion of flow-through share deductions from the minimum tax provisions.
7. Robert M. Buchan, "Notes for remarks to the Prospectors and Developers Association Convention", March 10, 1986.

This study is focused on flow-through shares as a financing technique in the mining industry. It is based on data collection on the level and nature of such activity on the three principle Canadian stock exchanges, Toronto, Montreal and Vancouver, and draws on the most recent surveys conducted by the federal Department of Energy, Mines and Resources as well as on direct data collection. Industry statistics available through Statistics Canada on the overall financial structure and performance of the mining sector were analyzed, to place flow-through financing within the overall industry context. Interviews were conducted with industry participants in both Canada and Australia, to provide industry opinion and ascertain likely future trends (see list of participants in appendix I). A computer model was developed using Lotus 1-2-3 to simulate the risk exposure and tax effects of flow-through share financing under alternative potential scenarios.

Chapter 2 contains an overview of the industry financing and activity. A review of flow-through share activity levels in Canada is given in chapter 3. In chapter 4, the alternative forms of flow-through share financings are characterized. Chapter 5 presents the analysis of flow-through share risk exposure and returns, from both a company and an investor perspective. An international comparison of mine financing activities based on the Australian market is presented in chapter 6. Finally, in chapter 7, the overall conclusions and summary of findings are given.

2. OVERVIEW OF INDUSTRY FINANCING AND ACTIVITY

To understand the importance and the impact of flow-through share financing, the overall position and financial performance of the industry in Canada must be considered. In this section, a framework for understanding the financing choices of the industry is presented by reviewing its overall levels of operation and financial results.

Industry Revenues

The level of revenues and profits for the Canadian metal mining industry based on Statistics Canada reports for the past decade is shown in figure 1. We see that the industry's sales revenues peaked at over $10 billion in 1980 and rapidly receeded in 1981 and 1982 to $8 billion. Very little recovery in revenues is evident in 1983 or 1984.

This massive reduction in revenues is paralleled by an even greater decline in net income, which saw the industry, on average, in a loss position in 1982 after peaking at a profit level of $2 billion in 1979-80. Again profit levels recovered only marginally in 1983 and 1984 and remained at substantially depressed levels in relationship to the pre-1982 levels.

Assessment of the return on equity for the metal mining sector is shown in figure 2. Here we see that, while return on equity was over 20 percent in 1979, the subsequent deterioration resulted in a loss in 1982 and only modest recovery to the 5 percent level by 1984. At this level, industry returns are still substantially below even the pre-1979 levels of around 9 percent. Furthermore, profitability must be judged to be grossly inadequate, in the face of Canada bond yields of over 10 percent and substantially higher average industrial returns.

Under such profitability conditions in the industry, it is evident that many companies have, since 1982, operated in a non-taxable position and are not in a position to benefit from fast write-off provisions for exploration activities or to utilize earned deletion allowances from such activities. In fact, figure 3 shows that the total current taxes payable were only $100 million in 1983, a significant recovery from the tax credit position of 1982. Such profit levels do not permit the industry to obtain full tax advantages from their exploration activities, which would be restricted by the reduced cash flow available in any case. In this context, the evolution in 1983 of flow-through financing of exploration which transfers the tax write-offs directly to the investor is quite understandable.

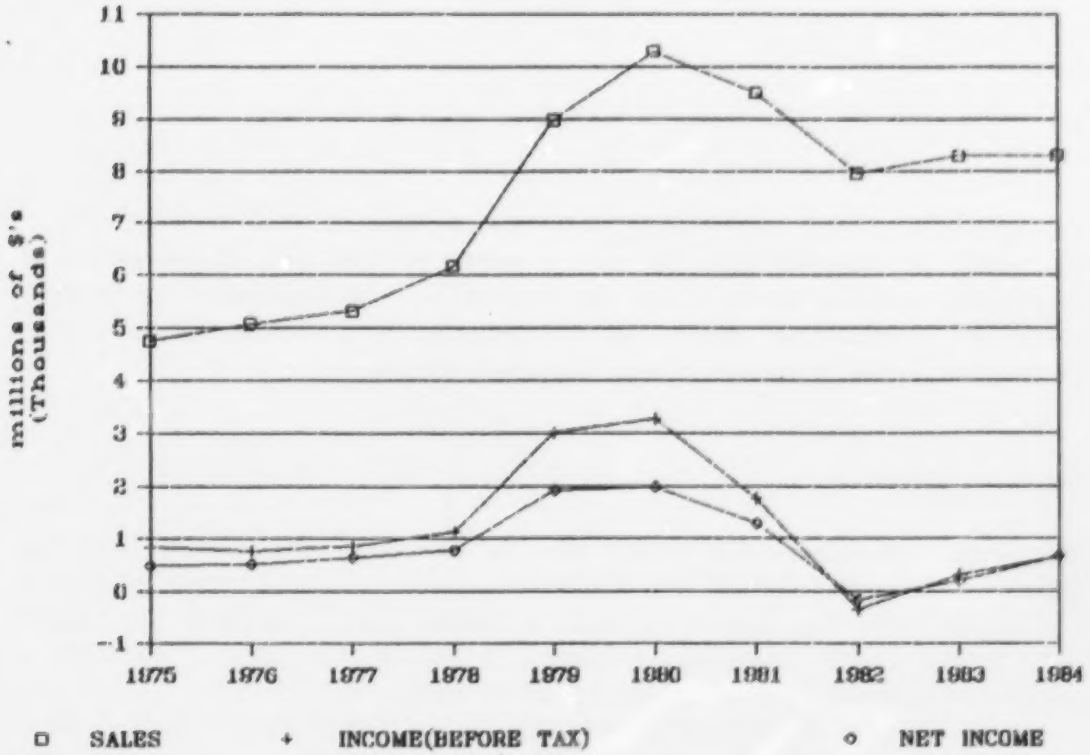

Figure 1. Metal Mine Financial Statistics, Income Statement Accounts

Source: Statistics Canada, Corporation Financial Statistics, Metal Mines.

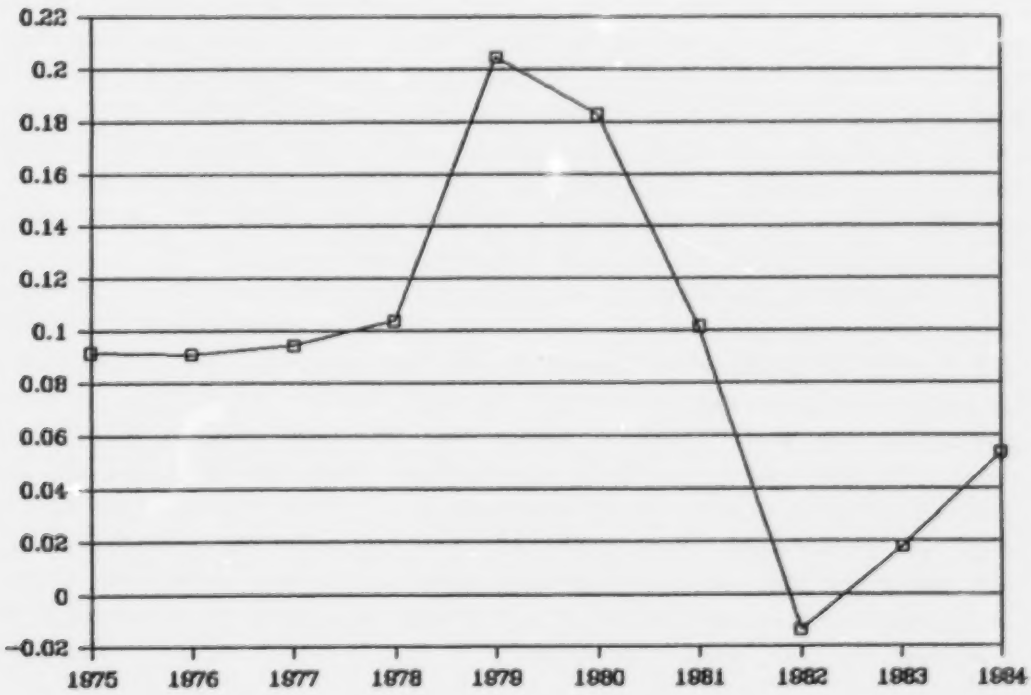

Figure 2. Metal Mine Financial Statistics, Return on Equity

Source: Statistics Canada, Corporation Financial Statistics, Metal Mines.

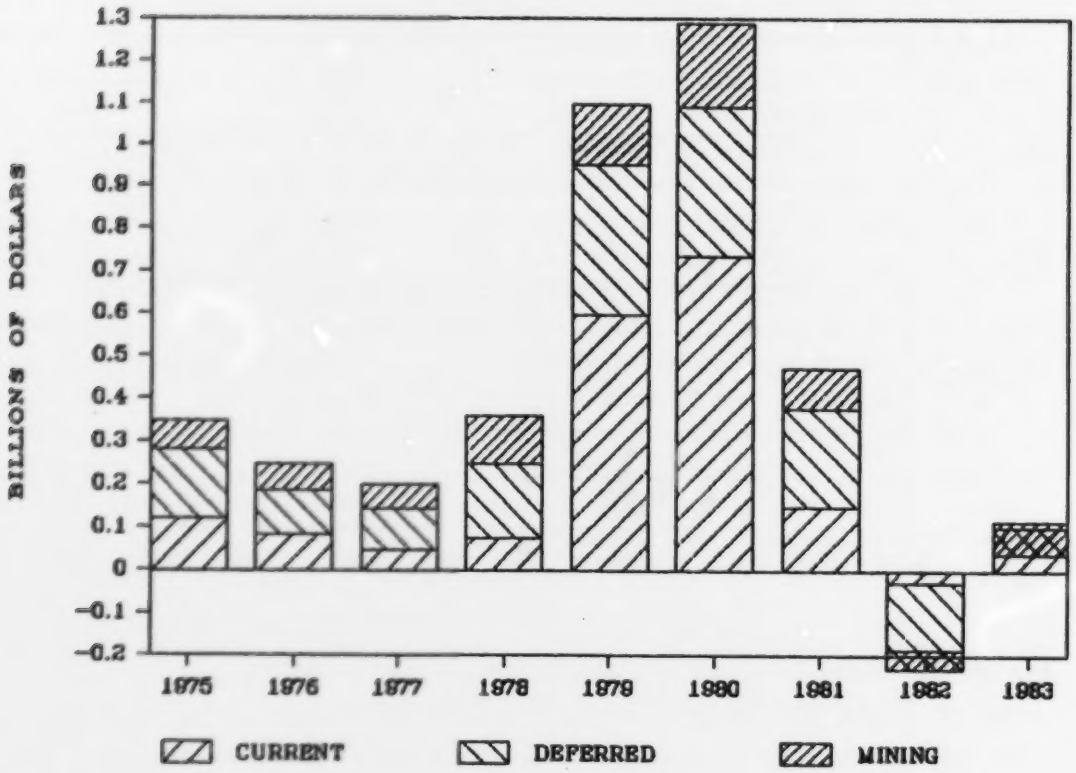

Figure 3. Metal Mine Financial Statistics, Income Taxes

Source: Statistics Canada, Corporation Financial Statistics, Metal Mines.

Production/Exploration

It is also interesting to note the production statistics which underlie the industry's performance. In figures 4 and 5 we see the dollar values and volumes of the key base metals produced by the industry. The sharp declines in dollar production values which occurred in 1981-82 are much greater than the volume reductions. Thus for copper, for example, while dollar values fell from $1.85 billion in 1980 to below $1.2 billion in 1982, the volumes declined from just above 0.7 million tonnes in 1980 to 0.6 million tonnes in 1982. Clearly, the major factor operating was the significant decline in prices which occurred. Thus while by 1985 production volumes for both copper and nickel approached or exceeded 1980 levels, the dollar values continued to be substantially below 1980 levels.

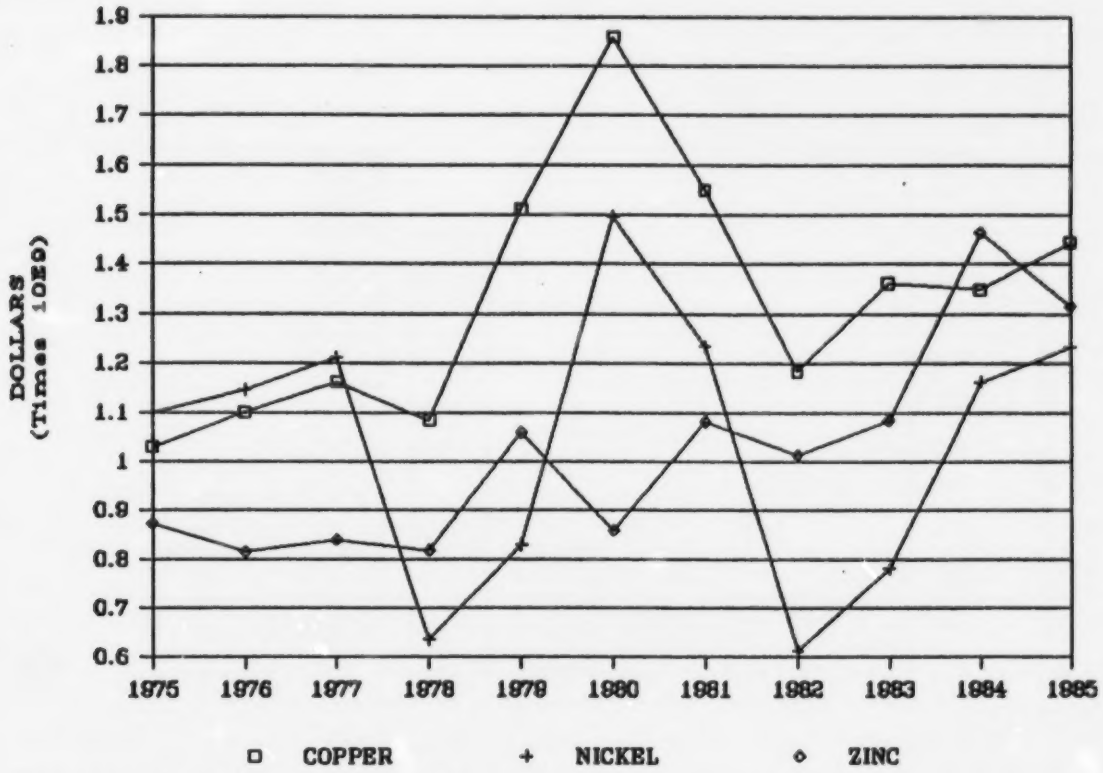

Figure 4. Metal Production - Dollar Values, Base Metals
Source: Statistics Canada, Metal Mining Industry.

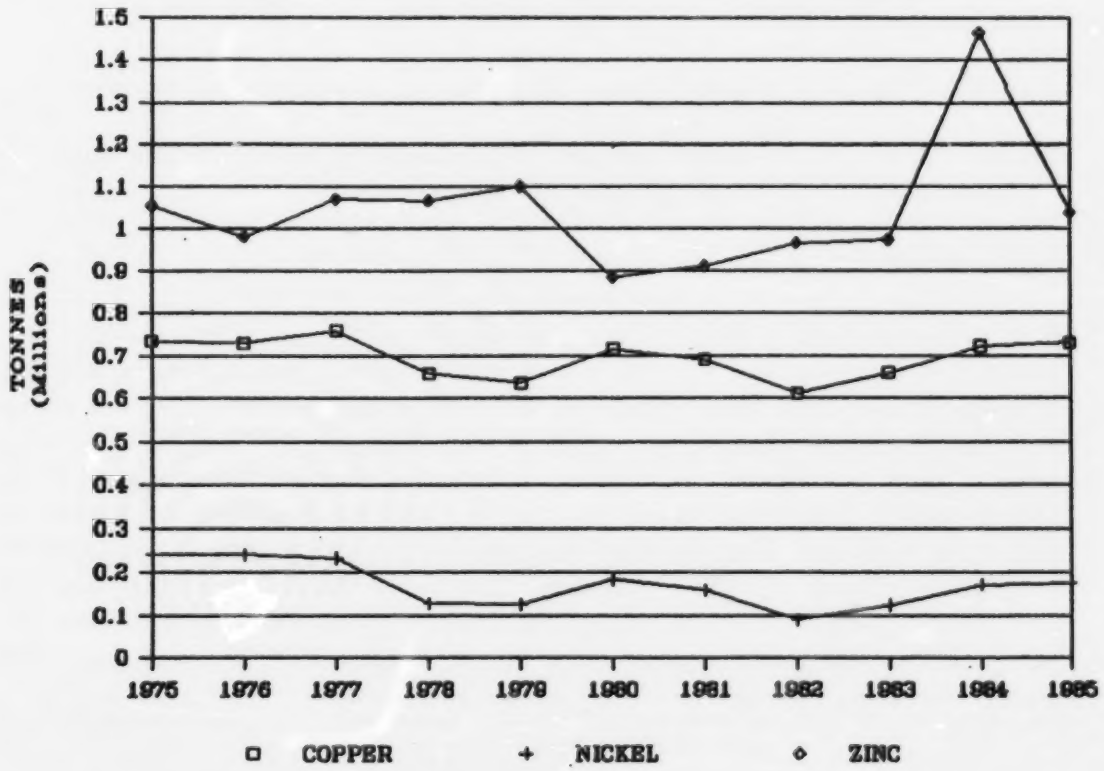

Figure 5. Metal Production, Base Metals
Source: Statistics Canada, Metal Mining Industry.

On the other hand, the position of the precious metals, gold in particular, has been somewhat different. These results are shown in figures 6 and 7. We can see that the production volume of both silver and gold has increased in the period from 1980 to 1985. Gold production has risen steadily, from the pre-1980 levels of 50+ million grams per year to 85+ million grams in 1985. Consideration of figure 7 shows that this marked rise in production has offset the price decreases since the 1980 peak, and 1985 gold dollar values exceed even the 1980 peak. More relevantly, gold dollar values have shown continued growth in the 1982-85 period.

In response to the above industry conditions, the exploration activities of both the metal mines and the exploration companies are shown in figure 8. It must be noted that a larger proportion of total industry exploration expenditures is undertaken by exploration companies than by the producing companies. Such a pattern indicates that, in the absence of flow-through financing techniques, a large proportion of exploration activities would be within companies with no revenue stream and hence in a non-taxable position. Furthermore, such companies must rely on equity financing to support their activities.

Exploration expenditures rose initially in response to the boom revenues of 1980, but deteriorated from 1981 to 1983. Significant jumps in both general and on-property exploration occurred from 1983 to 1984 when total general and on-property exploration reached a level of $568.0 million, in contrast to $421.7 million in 1983. This total decreased somewhat in 1985 to $522.9 million and was expected to decline to the $472.2 million level in 1986. These expenditures are still above the depressed industry levels of 1983.

The renewed level of exploration coincided with the expanded use of flow-through share financing by the metal mining industry and with the rapid volume gains in gold production.

Similarly, as shown in figure 9, capital expenditures in the industry, which had fallen markedly from the 1981 peak of almost $2.0 billion to $1.1 billion in 1983, increased again in 1984. However, the 1985 results showed no change and a decline was expected for 1986.

Financial Structure

The overall financial structure of the industry can be seen in figure 10. The rapid growth in total assets came to a halt in 1981 and settled at the $25- to $26-billion level. The metal mining sector, which had used long-term debt to finance only 15 percent of total assets in 1980, became progressively more dependent on debt and the percentage of total assets

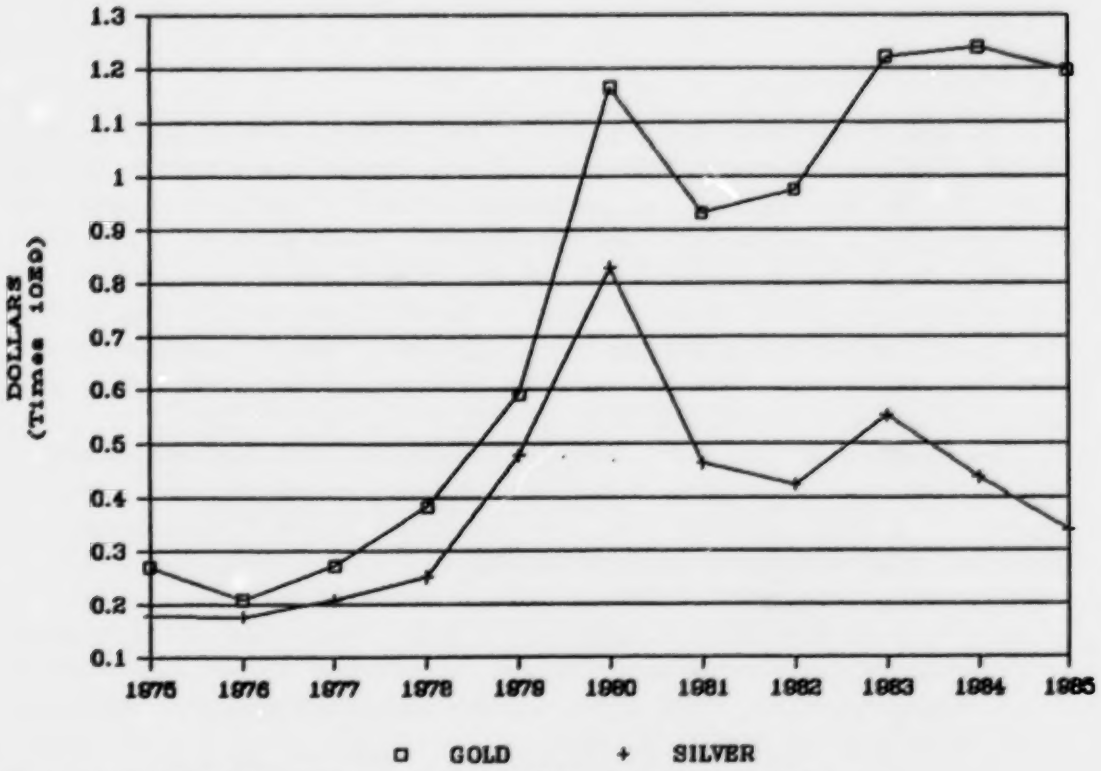

Figure 6. Metal Production - Dollar Values, Precious Metals
Source: Statistics Canada, Metal Mining Industry.

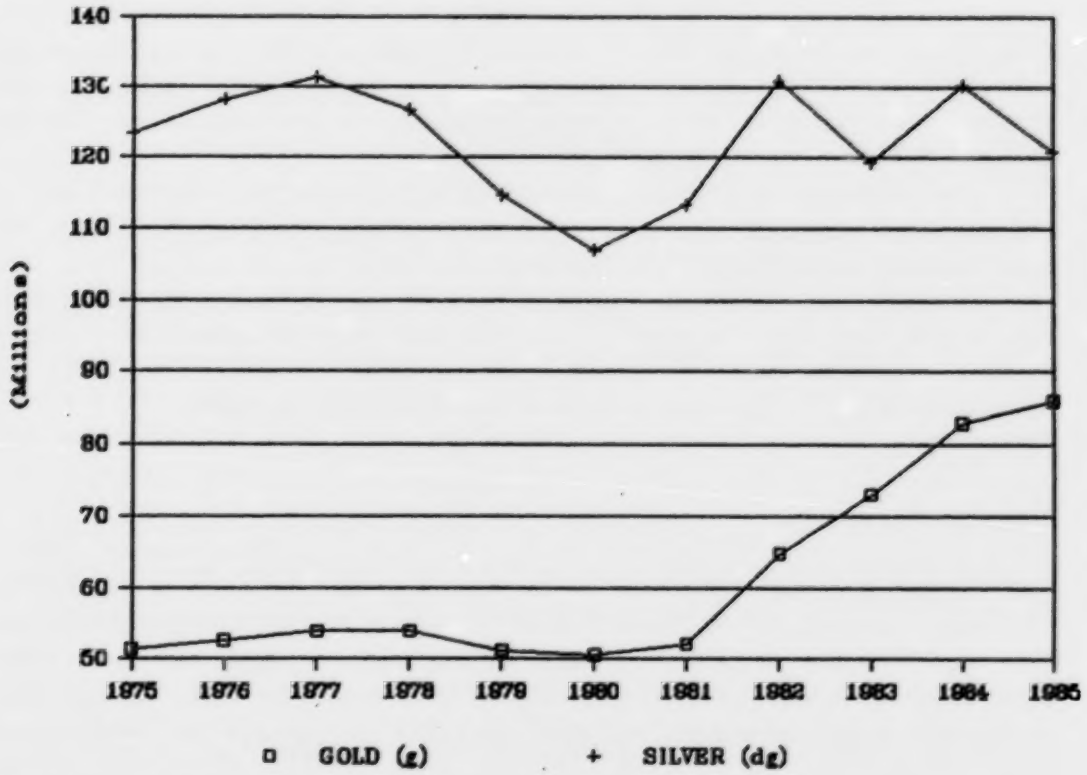

Figure 7. Metal Production, Precious Metals
Source: Statistics Canada, Metal Mining Industry.

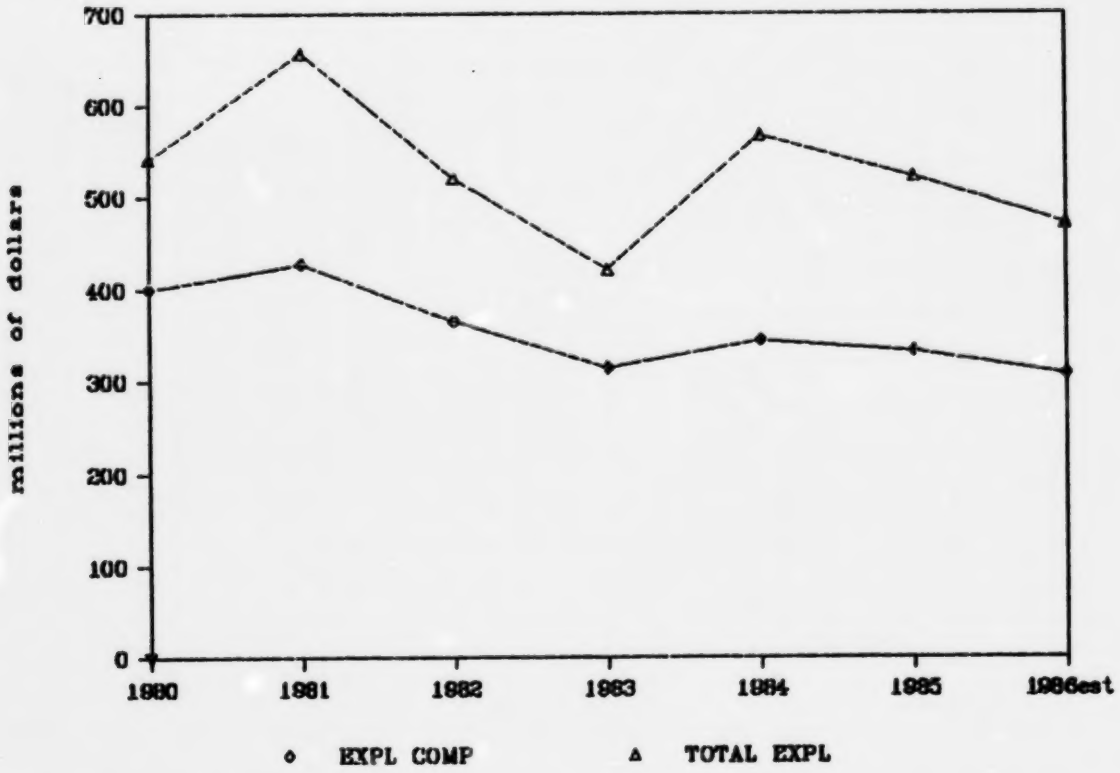

Figure 8. Exploration Statistics
Source: Statistics Canada, Investment Statistics, Metal Mines and Exploration Companies.

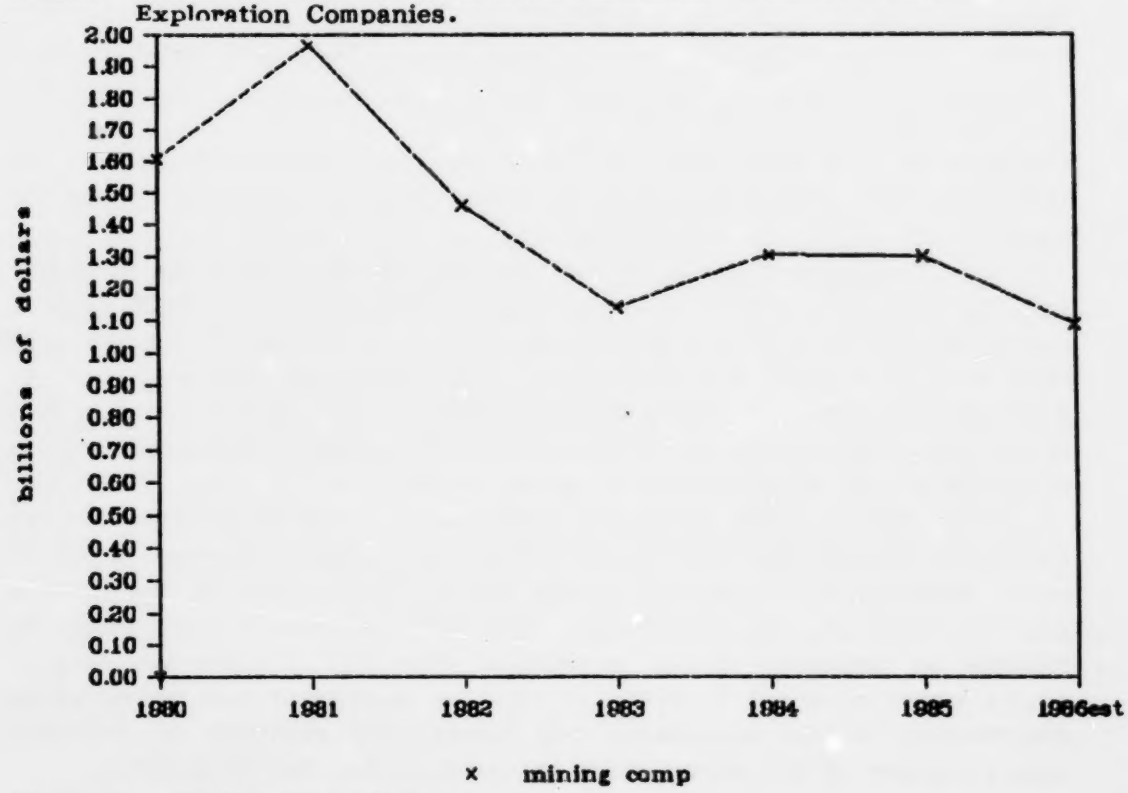

Figure 9. Capital Expenditure
Source: Statistics Canada, Investment Statistics, Metal Mines.

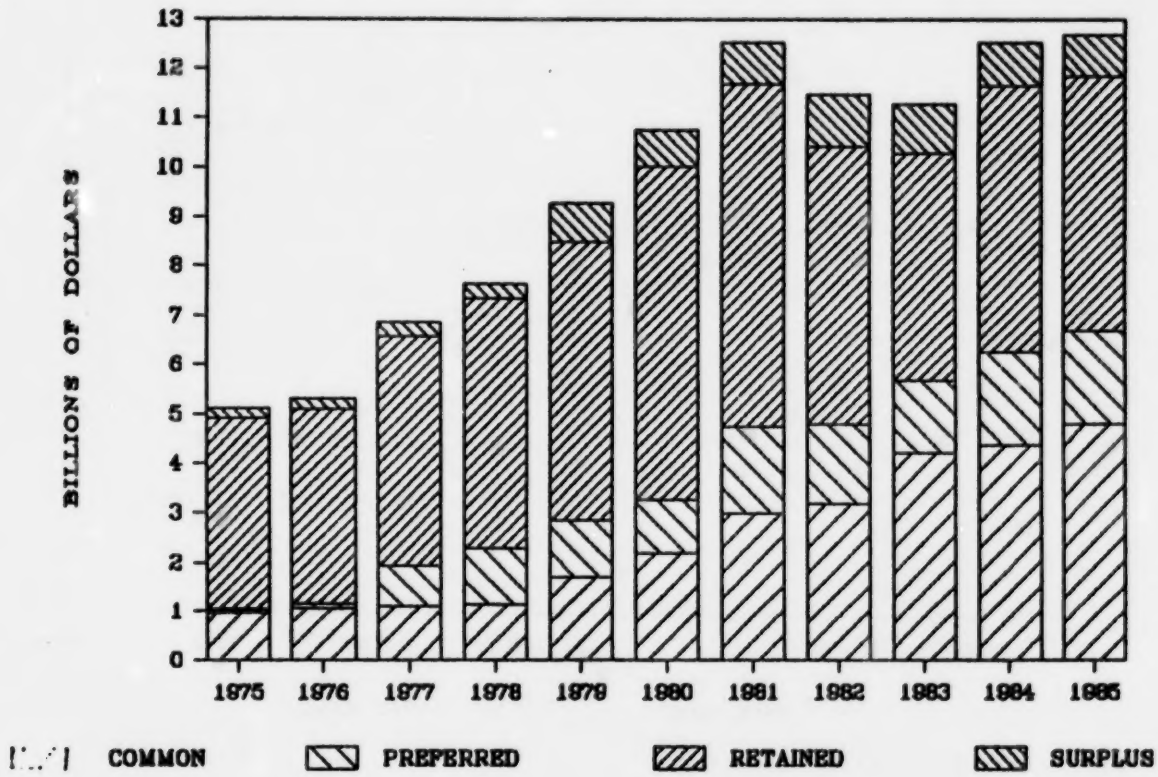

Figure 10. Metal Mine Financial Statistics, Equity Accounts
Source: Statistics Canada, Corporation Financial Statistics, Metal Mines.

financed by long-term debt had risen to approximately 28 percent by 1984. In 1985, some reversal of this trend begins to appear but debt remains at well above the pre-1982 levels.

The increasing reliance on debt in the 1981-85 period saw a corresponding rise in the debt-to-equity ratio of the industry. While debt to equity in 1975 was at a level of .36, this ratio fell to .27 by 1980 and then rose to a level of .56 by 1984. For a high-risk industry such as metal mining, which is highly cyclical, current debt may exceed prudent levels and be inhibiting the profitability of the sector. Increased infusion of equity capital would appear to be warranted.

From figure 11 the industry's performance in the equity accounts can be seen. Historically, the heavy reliance on retained earnings is apparent. However, the post-1980 period saw a deterioration of the level of retained earnings, as payouts exceeded the net income. An increased reliance on preferred shares is evident after 1977. After the drop in equity which occurred in 1982, we can see significant new share issues contributing to the sustenance and subsequent recovery of the total equity support of the sector which occurred in the 1983-85 period.

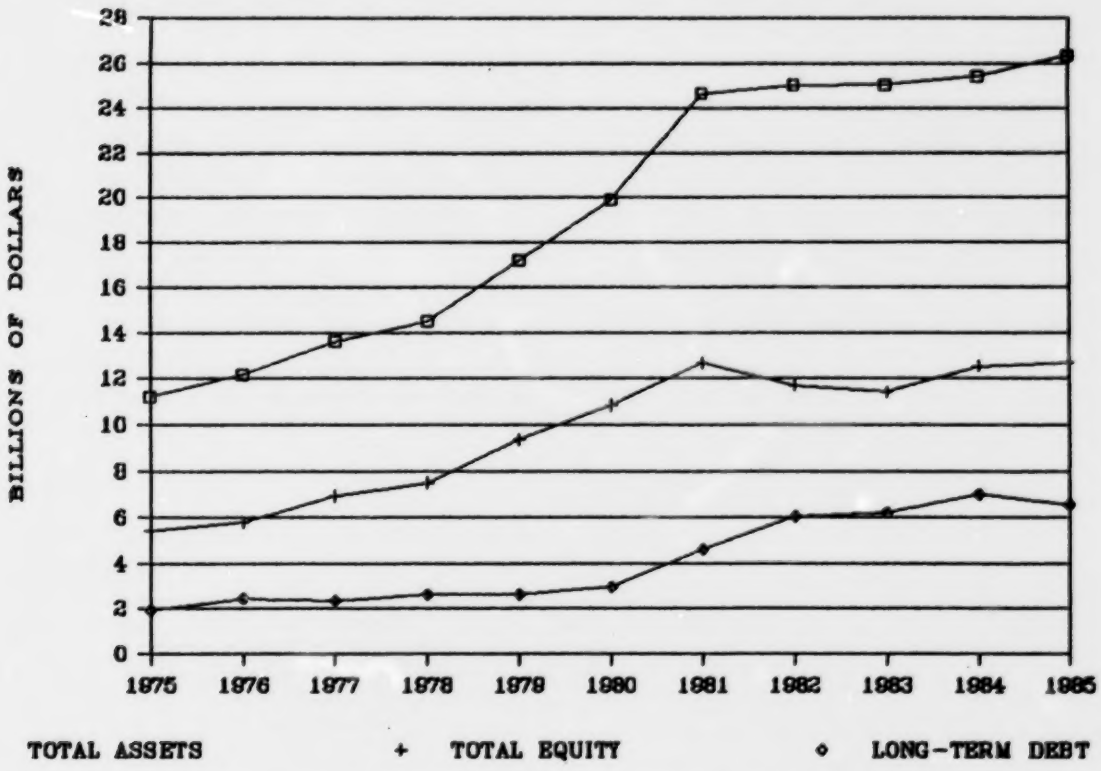

Figure 11. Metal Mine Financial Statistics, Balance Sheet Accounts
Source: Statistics Canada, Corporation Financial Statistics, Metal Mines.

Given that this review is based on companies with assets above $10 million, it must be recognized that the smaller exploration companies would be totally reliant on equity financing. Furthermore, lacking production revenues, these junior exploration companies would rely completely on new share issues. Thus, new investor funds form the core of the financing structure of this junior sector.

3. REVIEW OF FLOW-THROUGH SHARE FINANCING LEVELS

In order to determine the importance of flow-through share financing to the industry, a review was undertaken of all flow-through stock financings on the Toronto Stock Exchange (TSE) from 1983 to 1986. Similar compilations undertaken by the Prospectors and Developers Association[8] and the Department of Energy Mines and Resources[9] were also reviewed. These surveys cover the flow-through share activities of the TSE and also the Vancouver Stock Exchange (VSE) and the Montreal Stock Exchange (MSE).

The results of these reviews are summarized in table 1.

Table 1

FLOW-THROUGH SHARE FINANCING, 1983-86
($ millions)

Exchange	1983	1984	1985	1986
TSE	12.8	70.2	187.3	93.4[a]
VSE	1.2	19.4	50.2	64[b]
MSE	28.4	67.9	71.5	35[c]
Total	42.4	157.5	309.0	192[d]

Sources: Direct review of TSE company files; Energy Mines and Resources, communications; Vancouver Stock Exchange, communication.

[a] to May
[b] first half
[c] first quarter
[d] partial

These results would appear to be consistent with the estimates published by the Prospectors and Developers Association which suggested that $261 million was raised in flow-through shares in the period from January 1983 to April 1985.[10]

8. PDA Digest, "PDA conducts flow-through share survey"; and "Results of latest PDA flow-through share survey".
9. Lorraine Gailey, "Flow-through Share Financings in the Metals and Minerals Sector January 1, 1983 to March 31, 1985"; and "Tabulated results for VSE,TSE and ME with regard to flow-through share financing".
10. Preliminary indications are that over $500 million has been raised in flow-through shares in 1986 and that possibly $600 million will be raised in 1987. It must further be noted that the figures are related strictly to the shares of listed public companies and exclude both unlisted companies and private partnerships.

The implications of table 1 are clear: namely, the level of equity funds raised through flow-through shares is substantial and has grown significantly since 1983. The amounts raised are not inconsistent with the levels of exploration activity reported for the industry, which also showed sizeable growth in these years.

The distribution of these funds by size is shown in table 2.

Table 2

DISTRIBUTION OF FLOW-THROUGH ISSUES BY SIZE

Issue Size	1983-84		1985-86	
	% of No. of Issues	% of Amount	% of No. of Issues	% of Amount
Up to $100,000	16.0	0.6	26.7	1.7
Over $100,000 to $500,000	37.2	5.7	36.1	9.7
Over $500,000 to $1 million	17.0	6.6	15.1	9.8
Over $1 million to $5 million	19.2	24.1	17.8	45.6
Over $5 million	10.6	63.0	4.3	33.3
Average size	$1,811,000		$1,091,000	

Sources: Energy Mines and Resources, communication; and direct analysis.

As can be seen above, while the large majority of issues are below $1 million in size (70.2 percent for 1983-84 and 77.9 percent for 1985-86) these small issues only account for a small percentage of the issued amount (12.9 percent in 1983-84 and 21.1 percent in 1985-86).

Nevertheless, the trend appears to be toward smaller issues; smaller issues increased both in percentage of number of issues and in percentage of amount raised in the 1985-86 period, as compared to 1983-84. In fact, the average size of issues fell from $1.8 million in the 1983-84 period to $1.1 million in 1985-86. This trend is the result of the growing relative importance of flow-through shares issued by the VSE, as shown in table 1 above.

Further analysis of the 1985-86 statistics indicated the distribution of issue size by exchange shown in table 3.

Table 3

DISTRIBUTION OF FLOW-THROUGH ISSUES BY EXCHANGE
(percent)

	TSE		VSE		MSE	
	% of No. of Issues	% of Amount	% of No. of Issues	% of Amount	% of No. of Issues	% of Amount
Up to $100,000	7.1	0.2	43.3	8.0	1.8	0.1
Above $100,000 to $500,000	29.1	4.4	42.9	29.1	23.2	6.7
Above $500,000 to $1 mil	18.9	6.2	9.9	17.9	28.6	11.7
Above $1 mil to $5 mil	34.6	49.7	3.0	17.4	41.1	56.4
Above $5 mil	10.2	39.5	0.9	27.7	5.4	25.1

These statistics point out the specialized roles of the senior (TSE and MSE) exchanges and that of the VSE which specializes in junior issues. While 44.8 percent of the issues on the TSE and 46.5 percent on the MSE exceeded $1.0 million in size, only 3.9 percent of the issues on the VSE where in this range.

It is quite evident that both senior and junior companies are attracted to issue flow-through shares. Defining issues below $1 million as likely originating in junior mining companies and those above $1 million as likely to originate in senior companies, we can see that both sectors of the mining industry have participated in the issuing of flow-through shares. Noting that the 1983-85 period was marked by low profit levels for senior companies, and that junior companies, by definition, lack significant taxable income at all times, this attraction to both sectors of the industry of flow-through shares should be expected.

Also, given the trend toward improvement in profitability in the producing seniors by 1985, the gradual increase in participation by junior companies would again be expected. With further improvements in sector profits, it is likely that the trend toward the junior company issues of flow-through shares will continue.

4. DISCUSSION OF THE FORMS OF FLOW-THROUGH FINANCING

The flow-through share financings are occurring in a wide variety of forms and have been stimulated by the rapid evolution of mineral partnerships which hold a broad portfolio of mining shares. Most of the flow-through shares are initially issued as private placements, often directly to large mineral partnerships. These mineral partnerships in turn are public issues based on prospectuses which are approved by the securities commissions.

The basic alternatives by which a mining company may issue flow-through shares may be classified as follows:

- direct private placement or public issue of treasury shares to investors; or,

- private placement of shares to diversified mineral partnerships which issue units to investors.

Direct private placements are exempt from prospectus requirements. Public issue of treasury shares and the issue of partnership units to the public require a prospectus and must be approved by a regulatory authority. Each of the above approaches may be considered generic and includes a number of variations.

Table 4 shows the split between private or public direct issues to investors and the indirect private placements to diversified mineral partnerships over the 1985-86 period on the three stock exchanges considered.

Table 4

FORM OF ISSUE BY EXCHANGE, 1985-86

	TSE		VSE		MSE	
	% of No. of Issues	% of Amount	% of No. of Issues	% of Amount	% of No. of Issues	% of Amount
Private or public direct to investors	66.4	62.8	85.0	66.8	69.6	78.3
Private placement to diversified partnerships	33.6	37.2	15.0	33.2	30.4	21.7

From table 4, we see that the diversified mineral partnerships have captured a significant share of the total flow through financing market. By number of issues, however, the diversified partnerships are much less important on the VSE, where junior issues predominate.

Issues Direct to Investors

Shares placed directly to investors may be considered the basic traditional method for financing of mining companies. These direct issues imply that the investor is receiving the shares of a company directly, rather than through the intermediary of a diversified partnership. Inspection of flow-through shares issued in this direct fashion revealed a number of alternative forms. These included the following:

- public issues of new shares through underwriters;
- private placements of new shares to qualified investors;
- private placements of new shares with associated other mining companies.

With regard to the public issue of new shares, these forms of transaction are prevalent for the junior companies operating through the VSE, but also are evident for major mining companies with the ability to attract direct investment. Private placements of new shares to qualified investors are quite common. Qualified investors refers to existing shareholders, instituitional holders or large individual investors to whom shares may be sold without a prospectus. Often these appear to be linked with smaller issue amounts and may pertain to the existing shareholder group. Private placements of new shares with associated other mining companies tend to be related to longer intercorporate investments. These transactions have the effect of transferring the tax benefits of exploration write-offs to the acquiring company, as well as the effect of joint venturing.

These forms of flow-through shares imply the direct equity participation of the investor in the issuing company. In contrast to a partnership, the investor's liability is limited to the invested amount. However, where the issuing company is a junior exploration company, the investor's return is directly exposed to the risks of the exploration venture being undertaken. For senior companies, the investor is protected somewhat, in that he is exposed to the total risk of all the activities of the issuing company while still enjoying the full tax benefits of the higher-risk exploration expenditures.

Diversified Partnerships

A major innovation which has evolved in connection with flow-through shares is the diversified mineral partnership. The basic concept of all such partnerships is that the investor acquires a diversified portfolio of publicly traded mining stocks, rather than holding the shares directly. It performs for flow-through share investments the same role that mutual funds have in relation to equity investment. In fact, the diversified mineral partnerships operate essentially as mutual stock funds specializing in mining stocks.

Within this general framework, a number of variations to the highly successful funds are evident:

- an initial partnership unit acquires shares which are then transferred to a mutual fund whose units are cashable;[11]

- the mineral partnership is maintained to hold the shares earned by exploration and to liquidate these holdings on a scheduled basis;[12]

- an initial partnership is created to acquire the shares which are subsequently distributed on a pro-rata basis to the partners;[13]

- the initial partnership units acquire flow-through shares which are then transferred to a new company which manages the portfolio and a put option is issued on the shares of the new company.[14]

Each of the above variants is addressed to the need to provide the investor with liquidity while recognizing the market's limited capacity in this regard. In all cases, since the initial flow-through shares are issued on a private placement basis to the partnership, these shares are escrowed for varying periods, limiting their sale by the partnership. After expiry of the escrow period, which is generally of one year's duration, the flow-through shares acquired may be traded on the public exchanges. Of course, the sudden appearance of significant numbers of a company's stock for sale may create strong downward market pressure.

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11. CMP 1985 Mineral Partnership and Company Limited Prospectus, January 20, 1985.
12. TAP Mineral Exploration Limited Partnership Prospectus, April 8, 1986.
13. 1986 Mintax Mineral Limited Partnership Prospectus, May 9,1986.
14. First Exploration Fund 1986 Prospectus, May 9, 1986.

The CMP Approach

Let us consider the alternative approaches. First of all, the CMP approach solved two fundamental drawbacks of traditional mineral partnerships:[15]

- the partnership units are related to a broad set of mining company activities and not to a single mining exploration venture;

- the partnership units are given liquidity by conversion to a mutual fund of publicly traded shares.

Thus, although a partnership in a mining exploration had previously been able to benefit from the tax write-off provisions, the investor was fully exposed to the undiversified and direct risk of the exploration venture involved. With the new approach to mineral partnerships, his reward is linked to the total activities of the mining companies whose shares he is acquiring, and is further diversified across companies. If a substantial portion of the mineral partnership is invested in major producing companies, the investor is actually acquiring an interest in on-going mining or smelting operations and not simply an interest in the exploration activities. As a consequence, the risk exposure of the investor is significantly altered.

In addition, the transfer of the partnership assets to a mutual fund solves another problem with the partnership form of ownership, which traditionally limits the transferability of ownership interests. The ability to liquidate one's interest is based on the liquidity of the publicly traded shares in the mutual fund. Again, if a significant proportion of the shares consists of shares in highly-traded major companies, sale of interests at fair market values is possible. Of course, if the portfolio is dominated by less-traded junior shares, the mutual fund may have severe difficulties in meeting the redemption requests of investors and may, in the process, lower the market price for its participating companies to depressed levels.

The TAP Approach

The second, or TAP variant of the mineral partnership attempts to address the issue of market pressure on the stocks in the portfolio by pro-

15. This discussion presumes that the investor is risk averse. It must be recognized that many investors in exploration ventures seek risk exposure and may prefer undiversified positions for the opportunity of the upside potential.

posing an orderly liquidation over a set period. Of course, the drawback from the investor's perspective is the reduced liquidity which such an approach imposes, as well as the need to liquidate on the partnership schedule, which may differ from personal needs. With respect to market implications, the scheduled liquidation of the fund implies that the stock placement was not envisioned as permanent, and that new investors are assumed to be available to repurchase the shares issued.

The MINTAX Approach

The MINTAX variant to these issues is simply to distribute directly, on a pro-rata basis, the earned flow-through shares to the investors holding the partnership units. Thus, the initial investor is also the ultimate holder of the issued shares. In contrast to a mutual fund, this approach implies that each investor must individually manage the diversified stock portfolio. This portfolio may be highly fragmented and liquidation will require due attention to individual stock performance. Coincidental attempts at liquidation of shares upon initial distribution to the partners may imply severe market pressure on junior issues included in the portfolio.

First Explorations Approach

A totally innovative approach to segmentation of investment risks is provided by the First Explorations approach. This fund advances risk reallocation in the market by providing investors in the partnership with a guaranteed return through a put option of the continuing investment management company to which the flow-through shares are transferred. This guarantee is borne by the shareholders of the participating mining companies who are required to fund the company issuing the put options. In effect, the original investors in the partnership, while potentially giving up liquidity for a five-year period, are guaranteed at least their after-tax cost of investment with risk-free levels of return. At the same time, they will be holding shares in the management company which provides them with the upside potential rewards if the acquired shares should appreciate in value. Of course, the downside risk in this arrangement is being absorbed by the remaining investors of the participating mining companies who are, in effect, issuing the put option. Clearly, exploration risk does not disappear but has simply been reallocated. The mining company shareholders in turn acquire larger levels of exploration

funds with which to operate than in the absence of the mineral partnership investors.

Final Comment

All forms of flow-through shares must be acquired at premiums to a conventional share. This is a result of the transference of the tax write-off on exploration expenditures from the company undertaking the exploration to the investor. Depending on the tax position and earnings prospects of each issuing company, this transfer will have a different value from the perspective of the issuing firm. In the case of a junior company, the appropriate market price may not be readily observable and the premium may be difficult to recognize.

5. ANALYSIS OF INCENTIVE STRUCTURE FOR INVESTMENT IN FLOW-THROUGH SHARES

The economics of flow-through shares are clearly related to the tax effects created and the risk exposure that alternative arrangements imply. The incentive structure and impact on both the issuing corporation and the investor will be considered in this section.

Tax Rules

There are three main tax rules which are central to the operation of flow-through shares:

- Canadian exploration expense (CEE) is deductible from income from any source for income tax purposes;

- mining exploration depletion allowance is earned at the rate of 33 1/3 percent of funds spent on exploration and can be deductible up to 25 percent of taxable income from any source;

- tax write-offs generated by CEE may be assigned to the investor in shares by the company which is undertaking the activity, to the extent that funds have been provided by the investor.

This set of taxation rules, which was in effect by 1983, enables investors to purchase flow-through shares and receive the tax write-offs related to the exploration undertaken by the company. By more recent legislation, the company "renounces" the deductions for exploration to the investor, to assure that direct liability for such activities remains within the acting corporation and not with the investor.

Prior to 1983, while the exploration expenditures were deductible from all income by changes enacted in 1972, the tax rules restricted the application of the depletion allowance deductions to resource income, which limited the investors who could benefit from these deductions. Also, these depletion deductions would accrue only to direct investors, for example through a partnership, rather than to investors in the common shares of the firm. Both of these critical restrictions were effectively removed, enabling the evolution of the flow-through share market.

Corporate Taxation

In principle, it can be readily seen that the traditional restriction of the deductions for depletion to mining income, and the non-availability of transfer provisions, severely disadvantaged the junior exploration company compared to the senior mining company with established taxable mining income.

Table 5 shows the effect of this restriction on the net present value and rate of return of a mining venture in Ontario. The venture is first assumed to start with exploration activities and, after successful identification of an economic deposit, proceeds to the development and extraction stages until exhaustion of the orebody over a 13-year life cycle. Alternatively, it is assumed that the venture is unsuccessful and terminates after the exploration funds have been spent. This analysis is based on a computer model of the financial flows which incorporate the tax effects of both federal and provincial income tax and mining taxes, using Ontario for illustration. The basic structure was adopted from the format used by Robert Parsons[16] and a sample run is shown in appendix II.

Table 5

COMPARISONS OF RETURN ON INVESTMENT FOR TAXABLE AND NON-TAXABLE CORPORATIONS

Case		NPV[a]/Investment Amount	
Tax Status of Company	Venture Status	Exploration Internally Deductible	Exploration Deduction Renounced
Taxable mining income	Successful	1.30	0.65
	Unsuccessful	0.64	0.0
No initial taxable income	Successful	0.72	0.45
	Unsuccessful	0.0	0.0

[a] Net present value, discounted at 10 percent.

16. Robert B. Parsons, "Improved Flow-Through Share Rules", Price Waterhouse, 1986; and Price Waterhouse, "Canadian Mining Taxation", 1984.

From table 5 it can be seen that the availability of taxable income enhances the value of exploration activities to firms when they are in a taxable position. In this case, the total venture would be profitable (ie. net present value exceeds costs by 30 percent) if undertaken by the major company with taxable income, but is rendered uneconomic (ie. net present value below costs by 1 - 0.72 = 28 percent) for the junior company with no taxable income or for a major company in a non-taxable position. Similarly, if the exploration is unsuccessful, the taxable company enjoys a significant advantage over the company with no taxable income.

If an intent of the existing tax structure is to maintain neutrality across alternative organizations considering investment in this mining venture, then clearly the availability or lack of taxable income plays a non-neutral role. From the point of view of societal efficiency, the project would not be undertaken by a junior or by any firm in a non-taxable position, to the detriment of investment levels in the industry.

By considering the portion of table 5 which relates to the effects on the companies of foregoing (or renouncing) the deductions, we see that the difference between the company in a taxable position and the non-taxable company has been largely, but not completely, eliminated. Note, however, a key difference between the positions of the two types of companies for both outcomes, before and after renouncing the deductions. For the junior or non-taxable company, very little value is lost by renouncing deduction, with zero difference when the venture is unsuccessful and with only a 0.27 difference (0.72 - 0.45) when success occurs. By contrast, the major company with taxable income must forego 0.65 (1.30 - 0.65) or .64 (0.64 - 0.0) for successful or non-successful ventures respectively. Clearly, major companies will claim a premium for each dollar invested in flow-through shares to account for this loss of deduction. Theoretically, the premium could be as high as 65 percent of the invested funds. (This premium of 65 percent assumes the continued deductibility of exploration expenditures for mining tax purposes even under renouncement. This issue is not clearly defined in present tax regulations.)

These results explain the observed premiums over market value at which the shares of major companies are issued to flow-through mineral partnerships and to the public. Of course, the exact size of the premium will vary with the specific case circumstances and the sharing of benefits between the company and the investor.

Investor Economics

The economics of the firm must now be integrated with those of the investor in flow-through shares to understand the levels of incentives which have been created. The actual risk exposure and potential returns to the flow-through investor will be investigated on the basis of an integrated model of investor incentive and venture outcomes at the corporate level which leads to alternative market prices.

The central assumption of the investor return model is that, while purchase price can be defined as the market price plus any premium demanded for renouncement of tax deductions, the selling price for the investor units will depend on two key factors:

- the nature of the risk to which the investor is exposed;
- the degree of success of the exploration venture.

A consistent view of investment in flow-through shares must recognize the feedback of these two factors to the selling price for the investment units which will ultimately be realized.

The nature of the risk exposure of the investor is a function of the extent to which the selling value of his units will be determined by the expected outcome of the exploration venture. At one extreme is the investor in a direct flow-through share of a junior company, whose entire future value is dependent on the expected outcome of the exploration venture. In a continuum of risk, the investor in a major company share is exposed to a blend of the returns from existing operations and the portion of total company returns which depend on the outcome of the exploration venture. Thus, if the venture accounts for only a small fraction of the total assets of the major firm, the investor in flow-through shares is acquiring, not an exploration venture, but a share of the ongoing operations. This exposure will be determined by the percentage of the final selling price which is dependent on the existing firm activities and the percentage determined by the balance which is assumed to rest on the value of the exploration. Finally, the lowest end of the risk exposure is a structure in which the selling price is guaranteed, for example by a put-option structure. Thus, while upside potential is dependent on the venture or existing operations, downside risk is essentially eliminated.

In table 6 we see summarized the structure of the integrated model of corporate outcomes and the resulting investor returns under the base case assumptions. The model assumes that a starting market price exists. Investors in "Junior" shares are assumed to purchase at market prices, while investors in "Senior" shares purchase at a specified pre-

Table 6

INTEGRATED MODEL OF INVESTOR INCENTIVE AND MARKET PRICE

	Base Case	Junior (Non-Ded.) (Non-Taxable)	Senior (Non-Ded.) (Taxable)
Market price ($)	10,000	10,000	10,000
Premium ($)	0	0	5,000
Price paid ($)	10,000	10,000	15,000
Units bought	1	1	1
Investment cost ($)	10,000	10,000	15,000
Taxable income level ($)	100,000	100,000	100,000
Total units sold	2,700	2,700	1,800
Total funds ($)	27,000,000	27,000,000	27,000,000
Total CEE ($)	26,000,000	26,000,000	26,000,000
Individual deductions:			
CEE ($)	9,630	9,630	14,444
Depletion:			
a) 25% of income	22,593	22,593	21,389
b) 33.33% of CEE	3,210	3,210	4,815
Lower of a and b ($)	3,210	3,210	4,815
Total deductions ($)	12,840	12,840	19,259
Tax rate (%)	55.00	55.00	55.00
Tax shield ($)	7,062	7,062	10,593
After-tax cost of investment ($)	2,938	2,938	4,407
Selling price per unit ($)	10,000	4,501	9,961
Total proceeds ($)	10,000	4,501	9,961
Total return ($)	7,062	1,563	5,554
Capital gains tax (%)	0	0	0
Total proceeds after tax ($)	10,000	4,501	9,961
Total return after tax ($)	7,062	1,563	5,554
Investment duration (years)	1.00	1.00	1.00
Rate of return (%)	240.34	53.20	126.01

Assumptions:
- Deductibility renounced
- Senior premium 50.00%
- Existing activity ratio 80.00%
- Capital gains tax rate 0.00%
- Venture successful

mium. The total investment funds required are then raised by issuing the required number of units. This amount for illustration is set at $27 million, which links to the exploration expenditures assumed in our corporate venture model; it gives rise to $26 million of CEE and depletion allowances, made available as deductions to the investor. Assuming the given marginal tax rate of 55 percent, the after-tax cost of the investment is determined.

The selling price per unit is then linked to the assumptions made on risk exposure. If, as shown under the so-called "Base Case", the market value of the shares remains unchanged at $10,000, then the investor will realize a sizeable capital gain. If exempt from capital gains taxes, this gain results in a 240.34 percent rate of return over the assumed one-year investment duration.

Alternatively, under the "Junior" company column, a more realistic scenario is drawn. Assuming that the company consisted solely of the single venture, and assuming the "successful" venture outcome discussed above, then the selling price of the unit will be given by the proportional share of the net present value of the venture. This is shown as resulting in a selling price of $4,501. Despite the substantial drop from initial to final market price, the investors realized return is still positive at a level of 53.20 percent. In effect, the provision for flow-through shares has created a profitable venture for the junior company, despite the poor benefit-to-cost ratio when viewed from the company perspective. While the investor is fully exposed to exploration risk, the downside risk is partially offset by the deductibility of expenditures. This protection is unavailable at the corporate level of the junior company.

In the final column of table 6 under the Senior case, we see selling price as a combination of 80 percent of existing corporate activities and 20 percent related to the present-value outcome of the exploration venture. Thus, the investor will realize a blend of the market price for existing activities (assumed to remain constant at $10,000), and the present value of the exploration venture (assumed in this case to be "successful" as defined above). This result leads to a gain of $5,554 to the investor and a rate of return of 126.01 percent.

To appreciate the risk exposure aspect of the flow-through share investment, consider the results of table 7. The only assumption which has changed is that the exploration venture resulted in a failure to identify a viable orebody for development. Here we see the significance of the shielding effect of the other activities of the firm on investor returns. While the junior flow-through share results in a loss of 100 percent, the senior flow-through investment still yields the positive rate of 81.51 percent to the investor.

Table 7

INTEGRATED MODEL OF INVESTOR INCENTIVE AND MARKET PRICE

	Base Case	Junior (Non-Ded.) (Non-Taxable)	Senior (Non-Ded.) (Taxable)
Market price ($)	10,000	10,000	10,000
Premium ($)	0	0	5,000
Price paid ($)	10,000	10,000	15,000
Units bought	1	1	1
Investment cost ($)	10,000	10,000	15,000
Taxable income level ($)	100,000	100,000	100,000
Total units sold	2,700	2,700	1,800
Total funds ($)	27,000,000	27,000,000	27,000,000
Total CEE ($)	26,000,000	26,000,000	26,000,000
Individual deductions:			
CEE ($)	9,630	9,630	14,444
Depletion:			
a) 25% of income	22,593	22,593	21,389
b) 33.33% of CEE	3,210	3,210	4,815
Lower of a and b ($)	3,210	3,210	4,815
Total deductions ($)	12,840	12,840	19,259
Tax rate (%)	55.00	55.00	55.00
Tax shield ($)	7,062	7,062	10,593
After-tax cost of investment ($)	2,938	2,938	4,407
Selling price per unit ($)	10,000	0	8,000
Total proceeds ($)	10,000	0	8,000
Total return ($)	7,062	-2,938	3,593
Capital gains tax (%)	0	0	0
Total proceeds after tax ($)	10,000	0	8,000
Total return after tax ($)	7,062	-2,938	3,593
Investment duration (years)	1.00	1.00	1.00
Rate of return (%)	240.34	-100.00	81.51

Assumptions:
- Deductibility renounced
- Senior premium 50.00%
- Existing activity ratio 80.00%
- Capital gains tax rate 0.00%
- Venture unsuccessful

In table 8, we see the effect of disallowance of flow-through share investment where the deductions are taken at the corporate level and the venture is "successful". The junior investment shows a loss to investors and is unacceptable, while the senior company investment shows the investor positive returns at 5.91 percent.

Finally, in table 9 we see the results of conducting sensitivity tests on the results shown in table 6. Changes in the level of the capital gains tax rate, the personal marginal tax rate, the level of senior company premium paid, and the proportion of results dependent on the existing activities of the senior company are tested.

Clearly, the imposition of a capital gains tax lowers the returns for both junior and senior investments. Under the nonsuccessful-outcome scenario, some offset would be provided if the investor could offset the capital losses against other capital gains.

For lower marginal tax rates, we see from table 6 that the investment in flow-through shares becomes unattractive. The pricing of flow-through shares will generally reflect high marginal tax rates. The flow-through provision becomes of lesser value if investors have low personal marginal tax rates.

The premium paid for the senior investment directly affects the investor return. For low premium percentages, the investor return exceeds the percentage return available directly from a successful venture. Thus existing shareholders would be subsidizing the investors in flow-through shares. Clearly this is unacceptable, and a premium to the market price will be demanded. However, for the cases shown, even the 50 percent premium (of table 6) still results in some enhancement of flow-through investor returns over the direct investment in the successful venture.

Changes in the percentage of the return dependent on the existing activities of the firm will again alter returns from senior investments. For the 0 percent case, the company consists solely of the single "successful" venture. Since the benefit-to-cost ratio of the project (in the absence of corporate deductibility of exploration expenditures) is below 100 percent, the lower the percentage of results dependent on existing corporate activity, the lower the returns to the investor. This result would be even more pronounced if the "unsuccessful" venture cases were to be considered.

In summary, flow-through shares reduce but do not fully eliminate the tax disadvantage for undertaking mining exploration ventures within non-taxable (junior) companies as compared to investment through taxable senior companies. Furthermore, the risk exposure of investors is substantially different with junior flow-through shares where the investor is exposed directly to the exploration risk, and senior flow-through shares where the investor is exposed to a combination of existing-activity risk and exploration-venture risk.

Table 8

INTEGRATED MODEL OF INVESTOR INCENTIVE AND MARKET PRICE

	Base Case	Junior (Non-Ded.) (Non-Taxable)	Senior (Non-Ded.) (Taxable)
Market price ($)	10,000	10,000	10,000
Premium ($)	0	0	0
Price paid ($)	10,000	10,000	10,000
Units bought	1	1	1
Investment cost ($)	10,000	10,000	10,000
Taxable income level ($)	100,000	100,000	100,000
Total units sold	2,700	2,700	2,700
Total funds ($)	27,000,000	27,000,000	27,000,000
Total CEE ($)	26,000,000	26,000,000	26,000,000
Individual deductions:			
CEE ($)	9,630	9,630	9,630
Depletion:			
a) 25% of income	22,593	22,593	22,593
b) 33.33% of CEE	3,210	3,210	3,210
Lower of a and b ($)	3,210	3,210	3,210
Total deductions ($)	0	0	0
Tax rate (%)	55.00	55.00	55.00
Tax shield ($)	0	0	0
After-tax cost of investment ($)	10,000	10,000	10,000
Selling price per unit ($)	10,000	7,180	10,591
Total proceeds ($)	10,000	7,180	10,591
Total return ($)	0	-2,820	591
Capital gains tax (%)	0.00	0.00	0.00
Total proceeds after tax ($)	10,000	7,180	10,591
Total return after tax ($)	0	-2,820	591
Investment duration (years)	1.00	1.00	1.00
Rate of return (%)	0.00	-28.20	5.91

Assumptions:
- Deductibility renounced
- Senior premium 0.00%
- Existing activity ratio 80.00%
- Capital gains tax rate 0.00%
- Venture successful

Table 9

SENSITIVITY RESULTS ON RATE OF RETURN

	Rate of Return (percent)	
	Junior	Senior
	53.20	126.01
Capital Gains Tax Rate		
at 25%	39.90	94.51
Tax Rate		
at 40.0%	-7.46	36.53
at 25.0%	-33.7	-2.20
Senior Premium		
at 10%	53.20	192.02
at 25%	53.20	162.32
Existing Activity Ratio		
at 0%	53.20	122.50
at 20%	53.20	123.38
at 50%	53.20	124.70

Assumptions : as in table 6 except as shown.

6. COMPARISON WITH AUSTRALIAN MINE FINANCING ENVIRONMENT

The use of flow-through share financing in Canada will now be compared to the financing techniques used in a competing mining region, namely Australia. This chapter is based on interviews conducted with various individuals in Australia, as listed in appendix I. These included government tax specialists, industry association representatives, brokers, stock exchange officials and mining industry executives involved in exploration financing.

Current Tax Environment

Australia is currently in the process of a major reform of the tax system, the major thrust of which is an attempt to create a "flat playing field" with respect to taxation to provide equalized treatment across different sectors of industrial activity. The main changes being introduced include:

- equalization of personal and corporate tax rates, through a reduction of individual marginal tax rates from 60 percent to 49 percent and an increase of corporate rates from 46 percent to 49 percent;
- an imputation system for dividend income which will provide dividend tax credits for taxes paid at the corporate level;
- introduction of a capital gains tax, with provisions for inflation adjustment of the cost base;
- specific provision for the transfer of tax losses within corporate groups;
- a foreign tax credit on the foreign income of corporation;
- the taxation of fringe benefits payable by the employer.

A review of the tax-exempt status of gold mining activity is also under consideration. A number of these tax changes will affect the operations and financing of the mining sector.

The imputation system for dividend income will provide for tax-free intercorporate dividends. At the same time, dividends to individual in-

vestors will be grossed up to the implied level of corporate income and a tax credit will be given at the corporate tax rate of 49 percent. The effect should be to avoid the potential double taxation of income at both the corporate and the personal level. This change would make the Australian treatment of dividend income similar to the Canadian, although full integration of corporate and personal income taxation has been weakened by recent tax changes in Canada.

The dividend imputation system will have a major impact on gold mining activities in Australia. Gold mining is, at present, fully tax exempt. Under the imputation system, however, the distributed dividends from gold mining operations would be fully taxed at the corporate level. This change, if introduced, will substantially lower the after-tax returns from gold mining investment, and will affect mostly stand-alone gold mining companies with no other activities. For large diversified companies, the taxes paid on other than gold mining would provide effective shelter from the new imputation tax on dividends.

The inclusion of specific provisions within the tax code to transfer tax losses within corporate groups is intended to facilitate such transfers without corporate restructuring. Under existing Australian tax laws, the effective sale of tax losses is feasible through corporate mergers and acquisitions. Further enhancement of the transfer of tax losses within a corporate group should enable corporations to utilize the tax benefits of such losses more fully. Through various forms of nominations, these tax losses may be transfered from companies in loss positions to profitable portions of corporate groups.

Such transfers of tax losses are particularly critical to mineral exploration and development activities. As discussed in chapter 5, the availability of taxable income against which to offset the tax losses created by mining exploration and development activities significantly alters the present value of mining ventures. Thus, the Australian tax reforms appear to further improve the potential utilization of tax losses created through mineral exploration. To the extent corporate profitability exists within diversified operations, the tax benefits of mineral exploration activity will be realized. The transfers are, however, limited to corporate groups and do not extend to outside corporations or personal income.

The provision of foreign tax credits is linked with a new system of taxation of foreign income. The balance of the effect is not fully evident, but is most likely to modify the incentive for foreign investment by Australian corporations. Mining as a highly internationalized industry will clearly be affected.

The taxation of fringe-benefits will have a major impact on the taxation of Australian mining companies. Most such companies operate in remote areas and often provide extensive employee benefits such as housing or living allowances. These fringe benefits will become taxable. Taxes on these benefits are payable by the companies, thus raising the effective tax rate on operations. By comparison, the taxation of fringe benefits in Canada is based on taxation at the personnel level. In principle, however, the two approaches should have similar effects.

The reduction in personal tax rates and the increase in corporate tax rates, bringing them both to 49 percent, is another attempt to neutralize the advantage of corporate versus personal income. The aim of the tax reforms was "revenue neutrality", with off-setting provisions to neutralize marginal rate changes. Accompanied by the introduction of a capital gains tax, the lowered personal tax rates may not significantly alter the terms on which capital will be provided through equity investment.

Key Provisions in Mining Taxation

Some of the basic provisions of the Australian tax code which affect mining activity and financing are as follows.

- Exploration expenditures are written off (100 percent) as incurred.

- Development expenditures may be deducted either over the life of the mine or on a 10-year-life basis.

- Plant expenditures may be deducted on a three-year or five-year straight line basis, for depreciation rates above or below 20 percent respectively.

- Transportation costs can be deducted on a 10-year or 20-year basis, at the taxpayer's option.

- Prior to July 1985, an "investment allowance" of 18 percent on eligible plant investments was available; this has been phased out with tax reform.

- The deductions for exploration or development expenditures can be claimed only by an entity which is established "to be in the business of mining".

- Since 1984, deductions may be claimed against any income, provided the business test is met.

- Gold mining activities have been totally exempt from income taxes since 1927 but this status is under review.

- Deductions created by gold mining activity are non-deductible from other income.

- Mineral taxes imposed by the state authorities are deductible for income tax purposes.

Comparison of these provisions with key elements of the Canadian tax code reveals the following similarities and differences:

- Exploration expenditures receive similar 100 percent write-off treatment for tax purposes.

- With the elimination of the investment allowance, exploration or development expenditures in Australia do not attract the depletion allowances that are available in Canada.

- Deductions for mining expenditures in Australia are limited to entities which are "in the business of mining" (in contrast to the wider deductibility provisions in Canada), although the deductions may then be applied against other income.

- The non-taxable status of gold mining is unique to Australia and might only be comparable to the three-year tax holidays which were available to mining in Canada in the past.

- Gold exploration and development creates no tax losses in Australia, due to the activity's non-taxable status, in contrast to full deductibility from any income in Canada.

Financing Instruments

The Australian mining industry shares with Canadian companies the same broad base of traditional financial instruments. These include:

- junior and senior mining company common shares listed on the domestic stock exchanges;

- general balance sheet financing including bond issues and term loans utilized by senior mining companies;

- project financing of major mine development through banking consortiums;

- use of international money markets, such as the euromarket, for foreign sources of financings;

- direct foreign investments of equity funds for major mines through co-venturing and partnership agreements with multinational firms.

Also, with the similar presence of both major mining companies and junior exploration companies, exploration activity in Australia is financed both internally, by the major firms, and through the external equity markets by the junior exploration companies.

As a consequence of the nature of the Australian tax provisions and the structure of the industry, the financial instruments currently being used to finance exploration activity in Australia differ from those used in Canada. A number of such differences are discussed below.

First of all, flow-through share financing, which has evolved as a key method for exploration financing in Canada, is not in use in Australia. This can be explained by several factors:

- the tax code restrictions of the explorations write-off to entities which are "in the business of mining";

- the reduced level of write-offs available for exploration expenditures due to the lack of "earned depletion" provisions;

- the non-taxable status of gold mining, which makes exploration expenditure for gold non-deductible from taxable income;

- the fact that the integrated major mining companies in Australia have generally remained in a taxable position, despite reductions in profitability.

These factors in combination have prevented the emergence in Australia of flow-through shares for mining exploration, although some activ-

ity in trusts has appeared in the petroleum sector. These trusts are similar to limited partnerships, and have been structured to comply with the business test portion of the tax code. In this manner, the requirement to be "in the business" is being partially circumvented by obtaining prior favourable rulings from tax authorities. Also, similarly to Canadian flow-through shares, the trust-units are being registered for trading on the Australian stock exchanges. However, with the structure of trusts being similar to a partnership, those trust units are encountering trading difficulties similar to those encountered by partnership units in Canada.

The tax shelter value to individual investors in flow-through financing instruments in Australia is clearly lower than in Canada. Without the depletion allowance, a lower tax shield value is provided.

Of even greater significance, in the current environment for mining, is the non-taxable status of gold mining in Australia. As in Canada, most of the recent exploration expenditures in the mining industry are focused on gold. Given that such expenditures are non-deductible from any taxable income, a flow-through financing vehicle is of no interest to investors. Furthermore, initial exploration activities are often undertaken within diversified mining companies and are not specifically identified as gold exploration expenditures.

It is interesting to note that the non-taxable status of gold mining effectively provides for an equal tax treatment for gold ventures within junior and senior Australian companies. Neither, in principle, is disadvantaged by the availability or non-availability of taxable income. Thus, gold ventures will have similar present values within both types of companies. Flow-through share financing in this portion of the industry would not improve the efficiency of capital allocation discussed earlier with regard to Canadian venture.

On the issue of general mining sector profitability, the continued taxable status of Australian major firms reduces the incentive for flow-through financings. In contrast to the Canadian mining industry, Australian firms appear to be less leveraged. With lower use of debt, the Australian major firms continue to be capable of utilizing the tax write-offs generated by exploration activity within their corporate groups. In conjunction with corporate loss transfer provisions, the major companies do not have any incentive to transfer tax losses by means of flow-through forms of financing.

The tax and economic environment in Australian gold mining has favoured the evolution of an innovative instrument for financing gold ore-body development. This instrument is the "gold loan" which is being used extensively by the smaller exploration companies. This form of financing consists of the following basic structure:

- the loan is denominated in amount of gold rather than in currency;
- the interest rate payable is low, in the range of 3 percent annually;
- the loan is secured by the orebody and is generally limited to about 25 percent of the estimated recoverable gold;
- the term of the loan is two to three years;
- the repayment of the principal is designated as a quantity of gold.

In effect, this vehicle is similar to a commodity bond and is particularly attractive in Australia[17] for the following reasons:

- the loan is in gold and thus provides a direct hedge on the value of the gold in place in the orebody;

- the interest rate is in real terms and is thus low, providing reduced carrying costs in the early stages of mine operations;

- the non-deductibility of interest expenses for gold ventures coincides with the interest in capital gains on behalf of lenders;

- the commodity linkage of the loan enhances its quality as "pseudo" equity, reducing the need for other forms of equity.

In summary, the different tax environment and industry position in Australia has resulted in the evolution of different approaches to mine financing. Flow-through share concepts are not attractive under Australian conditions. Innovative commodity-linked financing of gold ventures has recently evolved as an important method of fund raising. The senior companies are continuing to pursue more traditional financing sources.

17. While gold loans have also been used in Canada, the tax environment is sufficiently different that they do not constitute a major source of funding.

7. CONCLUSIONS AND SUMMARY

Flow-through share financing has had a significant impact on the financing of mineral exploration in Canada. Made effectivly available at a time when the mining industry in Canada was in a depressed condition, flow-through share financing provided additional investment incentive. This investment stimulus appears to have facilitated the revival of exploration activities, which dropped off sharply following the steep declines in mineral prices in 1982.

The level of flow-through share financing activity appears to have grown progressively since 1983. The most recent indications are that new flow-through share issues reached record levels in 1986. While flow-through shares continue to appeal to both the junior and the senior sectors of the industry, the number of junior issues appears to be increasing.

Deductability of exploration expenditures and the provision of earned depletion has been shown to have a large impact on project profitability. The availability or lack of taxable income results in substantial alteration of the expected returns from uncertain mining ventures. As a result, flow-through shares have largely eliminated the large tax advantage enjoyed by ventures undertaken within taxable senior companies, relative to junior exploration companies.

The nature of the investment risk faced by investors has been modified by numerous innovations. The central innovation may be classified as the removal of direct exploration risk from the investor in senior company flow-through shares. Thus, tax benefits of exploration are transferred to investors with taxable income, but exploration risk is shared with all existing equity holders in ongoing current activities.

A further innovation in risk management is the evolution of diversified mineral partnerships. These funds provide diversification of exploration risks by the creation of portfolios of mining stocks. In addition, the liquidity of exploration investments is enhanced by the public market of the shares acquired.

Some future directions require comment. The appeal of flow-through shares to the senior companies can be expected to decline as these companies regain taxable status. With taxable corporate income, companies have little incentive to issue flow-through shares since the tax benefits can be utilized internally. Thus, flow-through shares can be seen as providing equity financing incentives under conditions of poor profitability, and declining in use as industry conditions improve. While no immediate improvements are yet evident, the major companies will eventually regain profitablity and lose interest in flow-through financing.

In regard to the investor side, a number of factors will affect the investor appeal of flow-through shares. Most importantly, the current trend towards more junior company issues is changing the investment risk. With mineral funds increasing the level of junior company exposure, investors will become increasingly more exposed to exploration risk. Given that the high interest in flow-through shares originated in the relatively safe exposure provided by senior company shares, the investor demand for the more speculative shares may decline.

The use of the put-option approach to provide downside protection to the flow-through share investor offers only limited future growth potential. Central to this approach is the availability of sufficient risk capital within the issuing mining company to bear the full exposure of the exploration risks. Without strong speculative markets, the flow-through market will also be limited.

An evolving issue will be the marketability of the earned shares. If flow-through issues attract only short-term investors with high needs for liquidity, the flow-through share market cannot be self-sustaining. Ultimate holders for the earned shares must be available if liquidity is to be provided without major market pressure.

Finally, the future fate of the entire flow-through share market clearly depends on government tax regulations. The flow-through share market has evolved as a highly innovative financial market which allocates tax benefits and exploration risks to various participants with differing tax positions and risk-bearing preferences. Viewed in terms of the immediate effect, taxing authorities may see such financing innovations as simply costs to themselves. Of course, once profitability is restored at the industry level, the same tax benefits will be available to the senior portion of the industry even without flow-through shares. Depending on the perspective, the benefits of flow-through shares in neutralizing the advantage of the taxable corporation in mining investment, relative to the junior company, may be outweighed by the apparent cost. Clearly, significant restrictions on flow-through shares will effectively destroy the basis for their existence.[18]

From the Australian perspective, exploration expenditures face a totally different tax structure. With no taxation imposed on gold mining, no offsetting tax reduction vehicles are required. Also, with a profitable senior mining sector, tax loss transfers beyond the corporate group are unneccessary.

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18. The currently proposed tax reform would include changes in tax rates and could significantly alter the incentives provided by flow-through shares, even assuming that the key provisions are maintained.

Appendix I

LIST OF INTERVIEWS CONDUCTED

Canada

Robert M. Buchan, CMP Funds Management Ltd.

Lionel C. Kilburn, Falconbridge Limited and Prospectors and Developers Association

H. Douglas Hume, Nuinsco Resources Ltd.

Robert B. Parsons, Price Waterhouse

William Griffith, Prospectors and Developers Association

Izzie Lyon, Ministry of Northern Development and Mines

Edward G. Thompson, Consultant

John Bossons, Institute for Public Policy, University of Toronto

Derek Buntain, Merrill Lynch

Ivor Grimba, Tap Mineral Exploration

Australia

Wayne Mayo, Taxation, The Treasury, Canberra

Rod Fraser, Australian Mining Industry Council, Canberra

Alan R. Hewson, The Sydney Stock Exchange, Sydney

Robert G. Berglund, Australian Industry Development Corporation, Sydney

Peter B. Dudley, Australian Industry Development Corporation, Sydney

Norman Michelly, Ord Minnett, Sydney

John McLeod, CRA Limited, Melbourne

Dick Carter, Broken Hill Proprietory Co., Melbourne

Colin Palethorpe, Broken Hill Proprietory Co., Melbourne

Don M. Morley, Western Mining Corporation Ltd., Melbourne

Peter Maloney, Western Mining Corporation Ltd., Melbourne

John Auston, British Petroleum Company of Australia Ltd., Melbourne

Roger Gandy, British Petroleum Company of Australia Ltd., Melbourne

W.J. Smith, British Petroleum Company of Australia Ltd., Melbourne

Appendix II

CORPORATE MINING VENTURE MODEL

CORPORATE DEDUCTIBILITY- TAXABLE

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	TOTAL
UNITS PRODUCED	0	0	0	46400	46400	46400	46400	46400	46400	46400	46400	46400	46400	464000
PRICE PER UNIT	0	0	0	500	500	500	500	500	500	500	500	500	500	500
GROSS REVENUE($000)	0	0	0	23200	23200	23200	23200	23200	23200	23200	23200	23200	23200	232000
OPERATING EXPENSES	0	0	0	11820	11820	11820	11820	11820	11820	11820	11820	11820	11820	118200
FEDERAL INCOME TAX														
NET REVENUE	0	0	0	12180	12180	12180	12180	12180	12180	12180	12180	12180	12180	121800
CCA-														
CLASS 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLASS 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLASS 20	0	2175	6803	10856	5637	0	0	0	0	0	0	0	0	24751
RESOURCE PROFITS	0	-2175	-6803	1324	6543	12180	12180	12180	12180	12180	12180	12180	12180	97049
RES ALLOWANCE	0	-544	-1521	331	1636	3045	3045	3045	3045	3045	3045	3045	3045	24262
CDE	300	210	147	103	72	50	35	25	17	12	8	6	4	989
CEE	6000	10000	10000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	36000
INTEREST EXPENSE	350	854	1630	1324	445	173	0	0	0	0	0	0	0	4784
RESOURCE PROFITS	-6650	-12695	-16347	-1434	3390	7912	8100	8110	8118	8123	8127	8129	8131	31814
DEPLETION BASE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEPLETION ALLOWANCE	2000	8167	7667	333	333	333	333	333	333	333	333	333	333	21167
INCOME	-8650	-20862	-24014	-1767	3057	7579	7767	7777	7785	7790	7794	7796	7798	9847
PRIOR YEARS LOSSES														0
TAXABLE INCOME	-8650	-20862	-24014	-1767	3057	7579	7767	7777	7785	7790	7794	7796	7798	9847
FEDERAL TAX	-3114	-7510	-8645	-636	1100	2728	2796	2800	2802	2804	2806	2806	2807	3545
INVESTMENT TAX CR	0	1458	1380	0	0	0	0	0	0	0	0	0	0	2750
NET FEDERAL TAX	-3114	-8968	-9945	-636	1100	2728	2796	2800	2802	2804	2806	2806	2807	795

CORPORATE DEDUCTIBILITY- TAXABLE

ONTARIO INCOME TAX

NET REVENUE	0	0	0	12100	12100	12100	12100	12100	12100	12100	12100	12100	12100	121000
CCA-														
CLASS 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLASS 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLASS 28	0	2175	6083	10856	5437	0	0	0	0	0	0	0	0	24751
INTEREST EXPENSE	350	854	1638	1324	445	173	0	0	0	0	0	0	0	4784
CDE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CEE	7000	10000	10000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	37000
RESOURCE PROFITS	-7350	-13029	-17721	-1000	5098	11007	11100	11100	11100	11100	11100	11100	11100	55265
DEPLETION ALLOWANCE	-2450	-4343	-5907	-333	1699	3669	3727	3727	3727	3727	3727	3727	3727	18422
INCOME	-4900	-8686	-11814	-667	3399	7338	7453	7453	7453	7453	7453	7453	7453	36843
PRIOR YEARS LOSSES														0
TAXABLE INCOME	-4900	-8686	-11814	-667	3399	7338	7453	7453	7453	7453	7453	7453	7453	36843
ONTARIO INCOME TAX	-711	-1259	-1713	-97	493	1064	1081	1081	1081	1081	1081	1081	1081	5342

ONTARIO MINING TAX

NET REVENUE	0	0	0	12100	12100	12100	12100	12100	12100	12100	12100	12100	12100	121000
CCA-														
15% CLASS	0	0	1425	1425	1425	1425	1425	1425	950	0	0	0	0	9500
30% CLASS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100% CLASS	0	3000	5400	9600	0	0	0	0	0	0	0	0	0	18000
CEE	6000	10000	10000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	36000
MINING INCOME	-6000	-13000	-16825	155	9755	9755	9755	9755	10238	11100	11100	11100	11100	58380
PROCESSING ALLOWANCE	0	0	0	23	1463	1463	1463	1463	1535	1677	1677	1677	1677	14119
TAXABLE PROFIT	-6000	-13000	-16825	132	8292	8292	8292	8292	8696	9583	9583	9583	9583	44181
MINING TAX PAYABLE (ASSUMED 20% RATE)	-1200	-2600	-3365	26	1658	1658	1658	1658	1739	1901	1901	1901	1901	8836

CORPORATE DEDUCTIBILITY- TAXABLE

CASH FLOW

NET REVENUE	0	0	0	12100	12100	12100	12100	12100	12100	12100	12100	12100	12100	121000
INTEREST EXPENSE	350	854	1630	1324	445	173	0	0	0	0	0	0	0	4784
FEDERAL INCOME TAX	-3114	-8960	-9945	-636	1100	2720	2796	2800	2802	2804	2806	2806	2807	795
ONTARIO INCOME TAX	-711	-1259	-1713	-97	493	1864	1801	1801	1801	1801	1801	1801	1801	5342
ONTARIO MINING TAX	-1200	-2600	-3365	26	1650	1650	1650	1650	1650	1739	1901	1901	1901	8836
FIXED ASSETS - NET	0	14500	13000	0	0	0	0	0	0	0	0	0	0	27500
EXPLORATION FUNDS	27000													27000
EXPLORATION EXPENSE	6000	10000	10000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	36000
RESOURCE PROPERTY	1000	0	0	0	0	0	0	0	0	0	0	0	0	1000
INCREASE(DECREASE)	24675	-12534	-9615	10563	7483	5556	5645	5641	5550	5394	5393	5392	5392	64543
OPENING CASH	0	24675	12140	2525	13088	20571	26128	31772	37414	42971	48366	53759	59151	0
CLOSING CASH	24675	12140	2525	13088	20571	26128	31772	37414	42971	48366	53759	59151	64543	64543

NET PRESENT VALUE

NET REVENUE	36229
INTEREST EXPENSE	3533
FEDERAL INCOME TAX	-8210
ONTARIO INCOME TAX	837
ONTARIO MINING TAX	1133
FIXED ASSETS - NET	21751
EXPLORATION FUNDS	24545
EXPLORATION EXPENSE	25849
RESOURCE PROPERTY	909
CASH INCREASE(DECREASE)	34981.24

Bibliography

Australian Associated Stock Exchange, "National Statistical Information", 1 July 1984 - 30 June 1985.

Australian Mining Industry Council, "Background Notes on the Mining Economy", June 1986.

The BA Petroleum Explorers Trust Prospectus, 4 November 1984

Buchan, Robert M., "Notes for remarks to the Prospectors and Developers Association Convention", 10 March 1986.

CGA Magazine, "Mining flow-through shares allowed", 20(3) March 1986.

----------, "Marketing Mines", 107(4) April 1986.

CIM Bulletin, "Flurry of tax proposals affects flow-through shares", 74 (887) March 1986, pp. 111-114.

Canadian Mining Journal, "Flow-through shares are an attractive financing alternative " 104(12) Dec. 1983.

CMP 1985 Mineral Partnership and Company Limited Prospectus, January 20, 1985.

Coopers & Lybrand, "Mineral Industry Survey 1985", Australian Mining Industry Council.

Financial Post, "Flow-through (mining shares) sizzle" 80 (18), 3 May 1986, pp. 21-23.

----------, "Great explorations: flow-through mining shares produce a lode of value", 1 January 1986, p.32.

----------, "Tax shelter boom to mining (flow-through shares)", 79(40) 5 October 1985, pp. 23,25.

First Exploration Fund 1986 Prospectus, 9 May 1986.

Gailey, Lorraine, "Flow-through Share Financings in the Metals and Minerals Sector January 1, 1983 to March 31, 1985", Energy Mines and Resources, Mineral Policy Sector, (Draft).

----------, "Tabulated results for VSE, TSE and ME with regard to flow-through share financing", Communication, July 1986.

Goldquest Exploration Inc., Annual Report, 1985.

Hoeschen, Bruce, "Flow-through Share Financing in Canada: Issues and Implications", Faculty of Management Studies, University of Toronto, 16 December 1985.

Keating, Paul, Reform of the Australian Taxation System, (Canberra: Australian Government Publishing Service, 1985).

1986 Mintax Mineral Limited Partnership Prospectus, 9 May 1986.

Northern Miner, "Economics of mineral finds: four major parameters in exploration", 69(52), 1 March 1984 p. B6.

----------, "A 3b giant seeks a junior partner", 70(15), 21 June 1984, p. B3.

----------, "Extend flow-through funds in next federal budget, says PDA", 71(a) 9 May 1985, p.5

----------, "Industry applauds flow-through change", 71(39), 9 December 1985.

----------, "Quebec budget and its effect on mining companies to raise funds for Quebec exploration", 71(10), 16 May 1985, p. A24.

----------, "Quebec ministry studying new flow-through (shares) structure", 72(2), 24 March 1986.

----------, "Exchanges eager to encourage financing of junior mining companies", 72(3), 31 March 1986, p. 16.

----------, "Quebec alters flow-through rules, extends time limit", 71(43), 6 June 1986, p. 1, 13.

Northern Ontario Business, "Mine exploration tax reforms in effect", 6(4) January 1986, p. 8.

Parsons, Robert B., "1985 Budget Roundup", Price Waterhouse.

----------, "Two Steps Back, Three Steps Forward", Price Waterhouse.

----------, "Improved Flow-Through Share Rules", Price Waterhouse, 1986.

----------, "Turning Ore into Rock", Price Waterhouse.

Price Waterhouse, Canadian Mining Taxation, 1984.

----------, Corporate Taxes - A Worldwide Summary, 1985 Edition.

----------, Individual Taxes - A Worldwide Summary, 1985 Edition.

PDA Digest, "PDA conducts flow-through share survey", Summer 1985, p. 6.

----------, "Results of latest PDA flow-through share survey", Winter 1985-86, p. 4.

Reid, Alexander, "Financing of Junior Resource Companies on the Toronto Stock Exchange", Faculty of Management Studies, University of Toronto, 16 December 1985.

TAP Mineral Exploration Limited Partnership Prospectus, 8 April 1986.

Vancouver Stock Exchange Review, "Mines Minister responds on (flow-through financings)", December 1985, p. 11.

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Monographs and Collections

Conflict and its Resolution in the Administration of Mineral Resources in Canada, by R.M. Burns; 62 pages, 11 tables. Published 1976.

The Impact of the Mining Industries on the Canadian Economy, by R.W. Boadway and J.M. Treddenick; 116 pages, 15 tables. Published 1977.

The Transportation Impact of the Canadian Mining Industry, by A.I. Wallace; 154 pages, 17 tables. Published 1977.

Human Resources in Canadian Mining: A Preliminary Analysis, by J.A. MacMillan, G.S. Gislason, and S. Lyon; 174 pages, 48 tables. Published 1977.

Health and Safety in the Canadian Mining Industry, by G.W. Gibbs and P. Pintus; 248 pages, 58 tables. Published 1978.

The Canadian Nonferrous Metals Industry: An Industrial Organization Study, by E. Urquhart; 158 pages, 18 tables. Published 1978.

Economic Impacts and Linkages of the Canadian Mining Industry, by P.E. Nickel et al.; 140 pages, 31 tables. Published 1978.

Environmental Impact of Mining in Canada, by E.A. Ripley et al.; 274 pages, 45 tables. Published 1978, reprinted 1982.

Effects of Taxation on Base Metal Mining in Canada, by B.W. Mackenzie and M.L. Bilodeau; 188 pages, 29 tables. Published 1979.

Gold: The World Industry and Canadian Corporate Strategy, by E. Cousineau and P.R. Richardson; 192 pages, 32 tables. Published 1980.

The Impact of Policy Change on Decisions in the Mineral Industry: The Case of Exploration in Manitoba, 1969-77, by B.E. Owen and W.J. Kops; 116 pages, 8 tables. Published 1980.

The Role of Mineral Taxation in Industry/Government Conflict: The Case of the Saskatchewan Potash Reserve Tax, by David L. Anderson; 135 pages, 41 tables, 2 illustrations. Published 1981.

Profitability in the Canadian Mineral Industry, by Charles H. Pye; 178 pages, 42 tables, 12 illustrations. Published 1981.

Foreign Investment Control in the Canadian Mineral Sector: Lessons from the Australian Experience, by David L. Anderson; 180 pages, 22 tables. Published 1983.

Financing Canadian Mining in the Eighties: Strategies for Action, edited by David Yudelman; with papers by B. Bradley, A. Dorland, J. Erola, P. Gillin, P. Glenshaw, S. Greenwald, B. Kalymon, P. MacCulloch, B. Mackenzie, K. Murphy, A. Powis, R. Sultan, and D. Yudelman; 240 pages. Published 1984.

National Resources and International Bargaining Power: Canada's Mineral Policy Options, by Patrick J. Caragata; 204 pages, 23 tables. Published 1984.

Canadian Mineral Policy Past and Present: The Ambiguous Legacy, by David Yudelman; 188 pages, 9 tables. Published 1985.

An Analysis of Japanese Coking Coal Procurement Policies: The Canadian and Australian Experience, by David L. Anderson; 239 pages, 31 tables. Published 1987.

Proceedings

No. 1 Rate-of-Return Taxation of Minerals, edited by N.D. Olewiler and P.R. Richardson, with papers by B.W. Mackenzie and M.L. Bilodeau, P.M.T. White, N.D. Olewiler, J.T. Cawley, and E.P. Gush; 109 pages. Published 1978.

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No. 3 Current Concerns in Mineral Policy, edited by B.W. Mackenzie and C.E. McMurray, with papers by C.R. Archibald, W.J. Barbour, D.B. Brooks, J.S. Dowsett, J.M. Fleming, and G.A. Jewett; 75 pages. Published 1978.

No. 4 Canada's Mineral Trade: Implications for the Balance of Payments and Economic Development, edited by M.J. Wojciechowski, with papers by B.W. Wilkinson, D.J. McCulla, J.G. MacKinnon, A.G. Balogh, and W.G. Chambers and J.S. Reid; 113 pages. Published 1978.

No. 5 Employee Relations Initiatives in Canadian Mining, edited by M.J. Wojciechowski, with papers by W.J. Bennett, F.R. Nogas and J.P. Fulcher, W.F. Clarke, S.B. Jones, T.F. Cawsey and P.R. Richardson, and P. Warrian; 85 pages. Published 1979.

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